

I claim:

1. A method for detecting the presence of humans or animals in a vehicle, comprising the steps of:

3       a) acquiring one or more digital channel signal representations of the motion of the vehicle under test using one or more motion sensors placed on the vehicle;

6       b) computing the continuous wavelet transform of each channel signal to obtain a two-dimensional wavelet-space representation image of the time-frequency distribution of energy within each input signal;

9       c) computing a corresponding energy image for each channel signal from the wavelet-space representation;

      d) computing the total energy in the signal for each channel signal using the energy image;

12       e) comparing the total energy for each channel signal to a preset maximum and if the total energy in any channel signal exceeds the preset maximum, return an out of limit result for the test; otherwise

15       f) comparing the total energy for each channel signal to a preset minimum and if the total energy in any channel signal is below the preset minimum, terminate the test and return a pass result; otherwise

18       g) dividing the energy image for each channel signal into equal-length overlapping segments in time;

21       h) for each segment of each channel signal, computing the ratio of the resonant frequency energy to the total signal energy;

      i) when all segments have been processed, retaining the minimum ratio value as the result of the test; and

24       j) comparing the result of the test to a preset threshold, and if that result is greater than the threshold value, displaying an indication to search the vehicle, otherwise displaying an indication to pass the vehicle.